

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CRTG0005	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/010095	International filing date (day/month/year) 11 September 2003 (11.09.2003)	Priority date (day/month/year) 13 September 2002 (13.09.2002)
International Patent Classification (IPC) or national classification and IPC C23C 14/02, 14/16, 14/58, 4/02, 4/12, 4/18, 28/00, C25D 5/30, 5/44, 7/04		
Applicant CARAT GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 08 May 2004 (08.05.2004)	Date of completion of this report 23 June 2004 (23.06.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/010095

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages _____ 1-4 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-2 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the drawings:
 pages _____ 1/1 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/10095

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1, 2	YES
	Claims		NO
Inventive step (IS)	Claims	1, 2	YES
	Claims		NO
Industrial applicability (IA)	Claims	1, 2	YES
	Claims		NO

2. Citations and explanations

1. The following search report citations are specified in this report; the same numbering will be used throughout the procedure:

D1: DE 19 51 543 A (DUNLOP CO LTD) 23 April 1970
(1970-04-23)

D2: DE 199 34 323 A (FRAUNHOFER GES FORSCHUNG)
25 January 2001 (2001-01-25)

D3: DE 196 21 861 A (TECKER KLAUS) 11 December 1997
(1997-12-11)

D4: US-A-4 395 313 (LA SALA JOSEPH ET AL.) 26 July
1983 (1983-07-26)

D5: US-A-4 445 979 (ARNOLD ROBERT G ET AL.) 1 May
1984 (1984-05-01)

2. Prior art and novelty

2.1. D1 describes methods for the production of decorative coatings on metal articles, for example on wheel rims. For this purpose, according to one embodiment, a steel article is coated with a plastic, then a metal is applied, and subsequently the article is coated with an impermeable layer of plastic (page 3, lines 8 to 12).

In one variant of the method the metal is aluminium, which has been applied by a vacuum spraying method (page 3, lines 21 to 31).

According to another variant, the layer of plastic applied to the substrate is to be provided with a layer of an electrically conductive material and is then to be electrolytically chromium plated (page 2, lines 22 to 27). There is, however, no mention of using a vacuum spraying method also to apply the electrically conductive layer.

Claim 1 of the present application is therefore novel over D1.

2.2. D2 discloses a method for the metallisation of light metal components, e.g. wheel rims, e.g. by chromium plating. For this purpose, the component is coated with an electrodeposition paint, then activated with palladium, and finally coated with a layer of nickel followed by a layer of chromium (column 3, line 61 to column 4, line 5). A chromium electroplating step as well as an electroless chromium plating step are taken as implied, especially as these steps are mentioned in the introductory part (column 1, lines 24 to 26).

D2 also states that the prior art discloses the use of powder lacquers in coating methods of this kind (column 1, lines 36 to 53).

Claim 1 of the present application is novel over D2, since D2 does not mention applying the first metallisation layer by means of a PVD method or by thermal spraying.

2.3. D3, which is cited in the application, describes the chromium plating of automobile wheel rims of aluminium

alloy. In this process, there is first applied a layer of powder lacquer or wet lacquer, onto which there is then applied a layer of wet lacquer which, after drying, is like electroplated ABS plastic. This layer finally undergoes chromium electroplating. Since D3 does not mention the application of a first metallisation layer to the layer of plastic by means of PVD or thermal spraying, claim 1 of the present application is considered to be novel over D3.

2.4. D4 relates to a process for the chromium plating of plastics parts in the automotive industry. For this purpose, a part made of ABS or PPO is first plasma etched. Then two layers of different metals, e.g. nickel and copper, are vacuum deposited. Finally, this metal layer is chromium plated in the usual way (column 1, line 59 to column 2, line 68). D4 does not, however, disclose the treatment of a metal wheel rim. Claim 1 is therefore likewise novel over D4. D4 also states that, in the prior art, it is known to activate ABS or PPO surfaces with palladium and then to carry out electroless deposition of a thin layer of copper or nickel, onto which a layer of chromium is then electrodeposited.

2.5. In its introductory part, D5 (column 1, lines 9 to 16) also mentions that plastics substrates can be metallised by first applying a metal layer, e.g. copper, by an electroless chemical method, by means of vapour deposition or by means of sputtering. This metal layer is then electroplated and, for example, copper, nickel or chromium can be deposited.

D5 relates to the coating of decorative parts for the automotive industry (column 1, line 67; column 2, line 21) but does not explicitly refer to wheel rims. D5 does not

therefore anticipate claim 1 of the present application.

3. Inventive step

3.1. In the prior art, it is known first to provide light metal wheel rims with a lacquer layer and then to chromium plate them (D2 and D3).

The application of the lacquer layer has *inter alia* the advantage of electrically isolating the layer of chromium from the light metal wheel rim; thus, if the layer is damaged, there will be less susceptibility to corrosion.

For metallisation purposes, this lacquer layer is first activated with palladium and then there is applied, by electroless chemical deposition, a metal layer which subsequently undergoes chromium electroplating.

3.2. Unlike the prior art, however, the present application does not provide for activation with palladium and the subsequent electroless chemical deposition of a metal layer; instead it provides for the deposition of said metal layer by means of PVD or thermal spraying. In this regard, at least the deposition by means of PVD is suggested by the prior art, for the following reason:

3.3. D4 and D5 describe the chromium plating of plastics parts for the automotive industry. In D4 the electroplateable layer is applied to ABS or PPO by means of a PVD method. However, D4 mentions (column 1, lines 30 to 45) that, in the prior art, this layer is produced by means of palladium activation and electroless chemical metal deposition. The electroplateable layer can therefore be produced by two variants. The introductory part of D5 also mentions these two variants (electroless chemical vs.

PVD) as equivalent.

It therefore seems obvious also to coat a plastics layer which is on a metal substrate and is to be chromium plated, as is the case in D1 to D3, with an electroplateable layer by means of PVD (e.g. sputtering).

The combination of D3 and D4, in particular, appears to be obvious in this regard, since

- (a) both documents relate to the chromium plating of automotive parts, and
- (b) the chromium layer is applied to the same plastics layer (ABS).

3.4. It cannot, however, be deduced from D1 to D5 that the electroplateable layer is deposited without pre-treatment of the primer. Rather, D4 suggests plasma pre-treatment, while D5 mentions the vapour deposition process only in passing, without going into the details of the method.

The objective problem is considered to be that of providing an alternative method to the conventional electrodeposition method for the chromium plating of motor vehicle wheel rims, said conventional method being based on electroplated ABS plastic while the alternative method is distinguished by fewer method steps and is thus low-cost.

Since this solution indicated in claim 1 is neither suggested by nor deducible from any combination in the group comprising D1 to D5, the method defined in claim 1 is considered to be inventive.

3.5. It should also be observed that there is likewise

nothing in D1 to D5 to suggest applying the electroplateable layer by means of a thermal spraying method.

4. Industrial applicability

Claims 1 and 2 satisfy the requirement for industrial applicability (PCT Article 33(4)), since the technical subject matter of the present application can be made in industry or can be used in a technical sense.

re Certain defects in the international application

Contrary to the requirements of PCT Rule 5.1(a)(ii), the most relevant prior art documents, e.g. D2 and D4, are not mentioned in the introductory part of the present application.